CDM and Carbon Markets

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CDM and Carbon Markets

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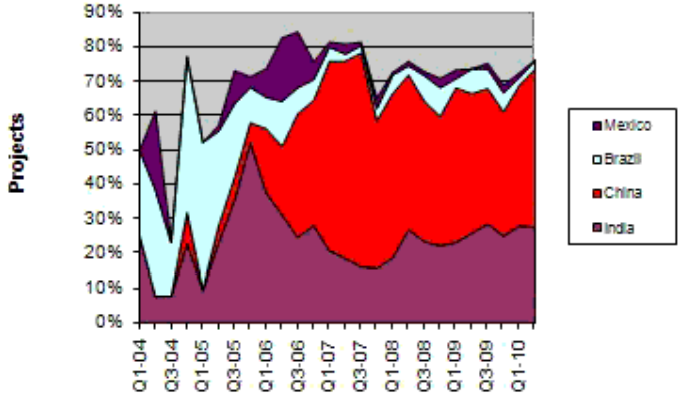
UNEP Risoe Centre

Outline of Presentation

- UNEP Risø
  - who we are and what we do
- Kyoto Protocol and targets – status
- CDM and carbon markets
  - Principles
  - Status of the CDM market
  - Project examples
  - UNEP activities
    - Capacity building
    - Regional promotion
    - Analytical and web services



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UNEP Risøe Centre – Energy, Climate and Sustainable Development

International research team of over 35 economists and scientists.

Based on agreement between Risø, UNEP and Danida. Located at Risø since 1990.

Mandate is to support and promote UNEP activities in the areas of energy and climate change, with a special emphasis on developing countries.

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The special setup of URC

- Integrated part of UNEP DTIE Paris
- Core research budget
- 35 - 40 economists and scientists from 17 different nations.
- Access to a broad range of energy scientists and specialists at Risø DTU.
- A wide network of collaborating institutions, NGO's and partners in more than 40 - 50 developing countries.
- A non profit public institution with high demands to procedures, transparency and accounting.

Focus on UNEP's climate change strategy

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UNEP Climate Change Strategy Priorities

- Adapting by building resilience to a changing climate
- Facilitating transition towards low carbon societies
- Improving understanding of climate change science
- Communicating and raising awareness

Thematic structure and strategic objectives

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Cleaner Energy Development

- Facilitating cleaner energy technology transfer
- Improve access to cleaner and efficient energy technologies
- Analytical support for overcoming political and institutional barriers

Energy and Carbon Finance

- Piloting new approaches within energy and carbon finance
- Enhancing a more equitable regional CDM project distribution
- Facilitating a more efficient carbon market

Climate Strategies and Resilient Development

- New approaches for assessing cc vulnerability, adaptation and mitigation
- Capacity building for integrating adaptation in dc policies and planning.
- Furthering the understanding of cc impacts and response options

Kyoto Protokollen

Emissions reduction:

- **5.2% reduction of emissions from Annex I in 2008-12 compared to 1990**
- **30% reduction compared to BaU**

Flexibility mechanisms”

- **Clean Development Mechanism (CDM)**
- **Joint Implementation**
- **Emissions trading**

United Nations Environment Programme
environment for development

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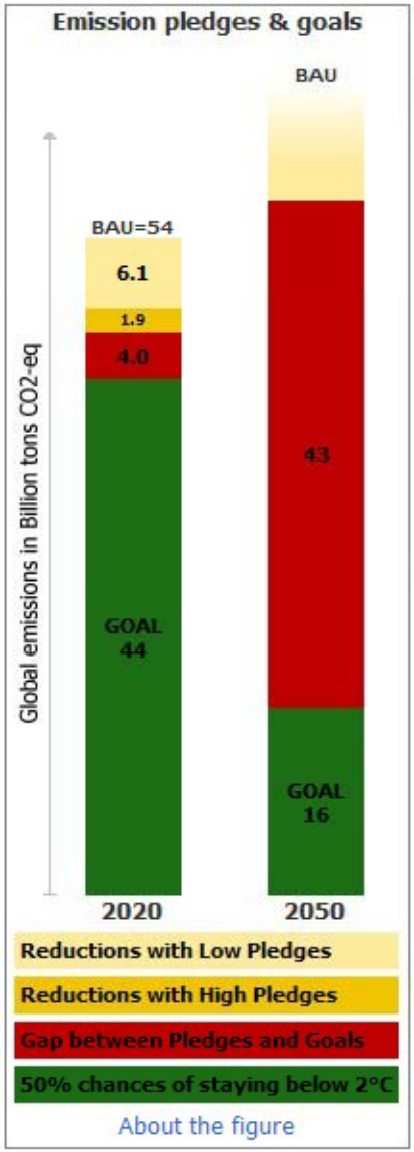
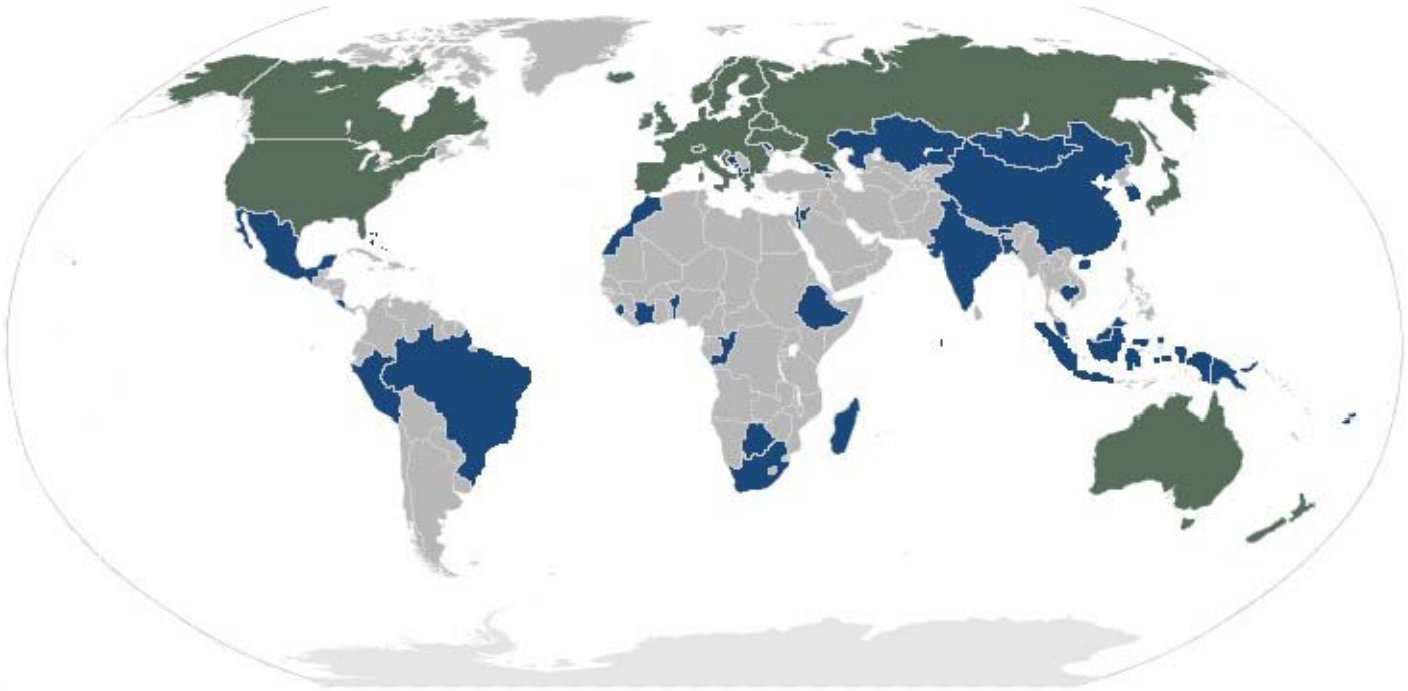


Welcome to the UNEP Climate Pledges Site

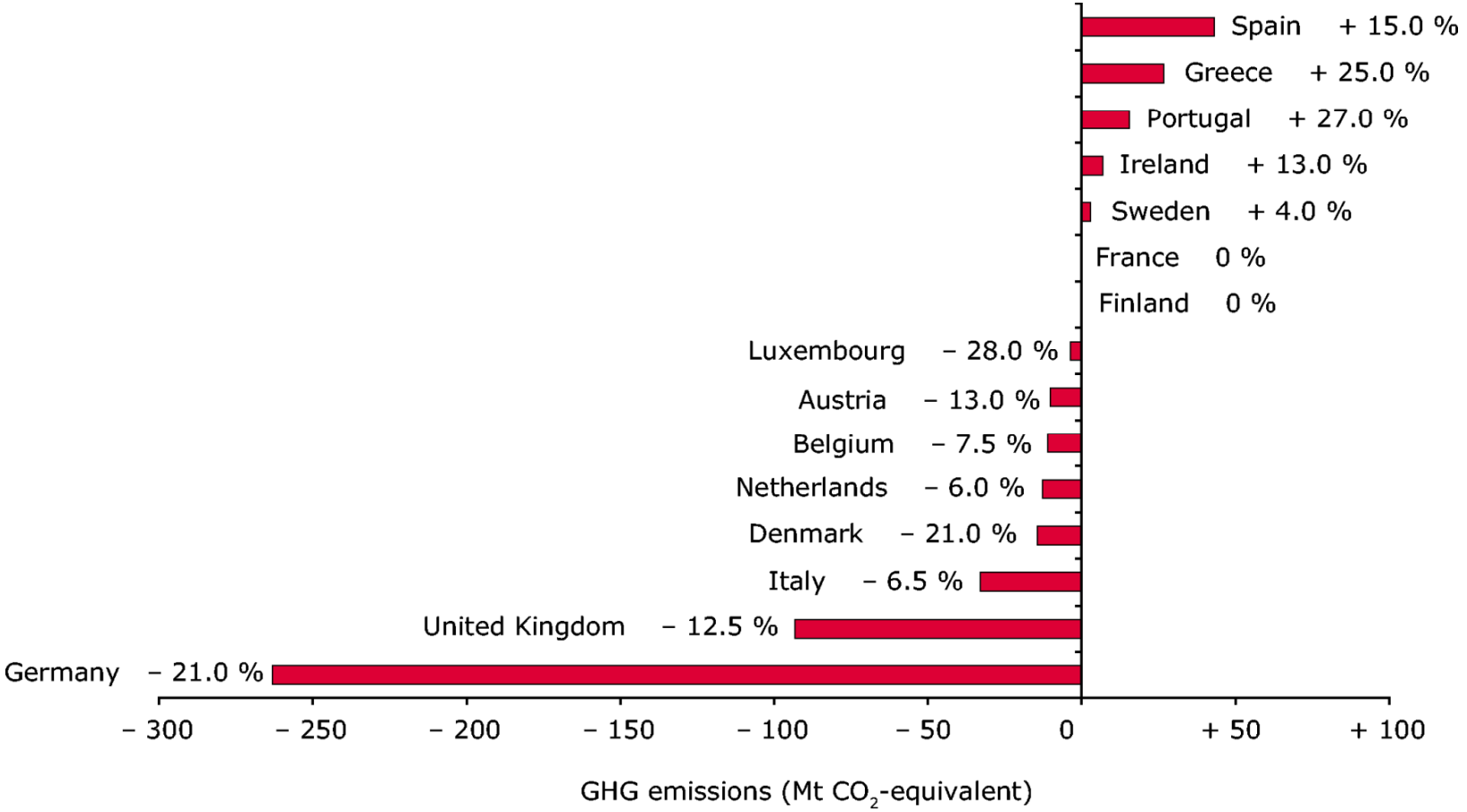
The site presents the current country pledges and the remaining gap for reaching global climate change mitigation goals. The site and graphics will be continuously updated with new pledges, mitigation commitments and information from country parties.

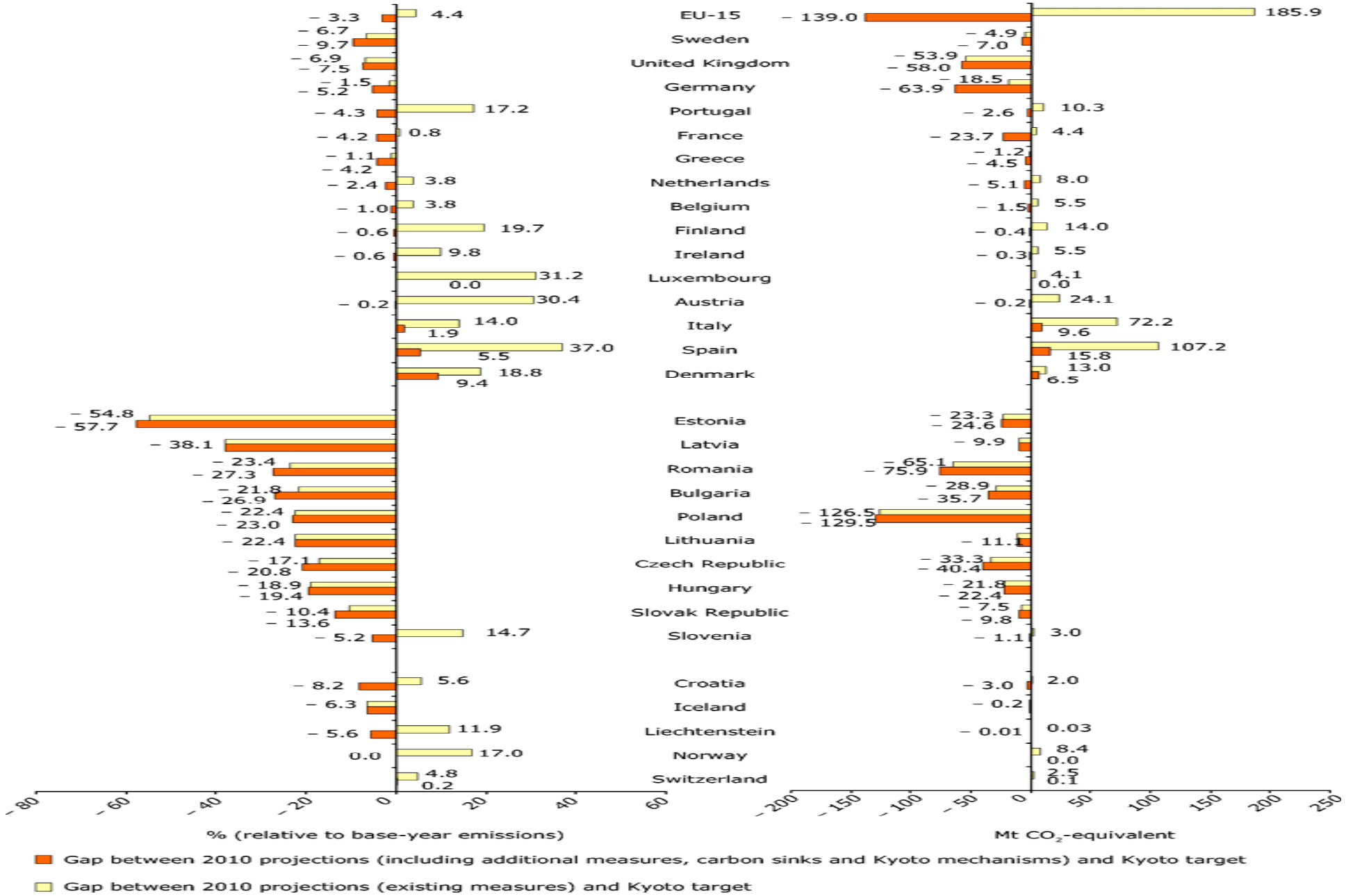


Countries with pledges	Annex I countries	Non Annex I countries
IPCC GHG reduction recommendation	25% - 40 % below 1990 in 2020	15 % - 30 % below 2020 BAU in 2020
With current pledges	12% - 17%	

Site last updated on: 3/15/2010

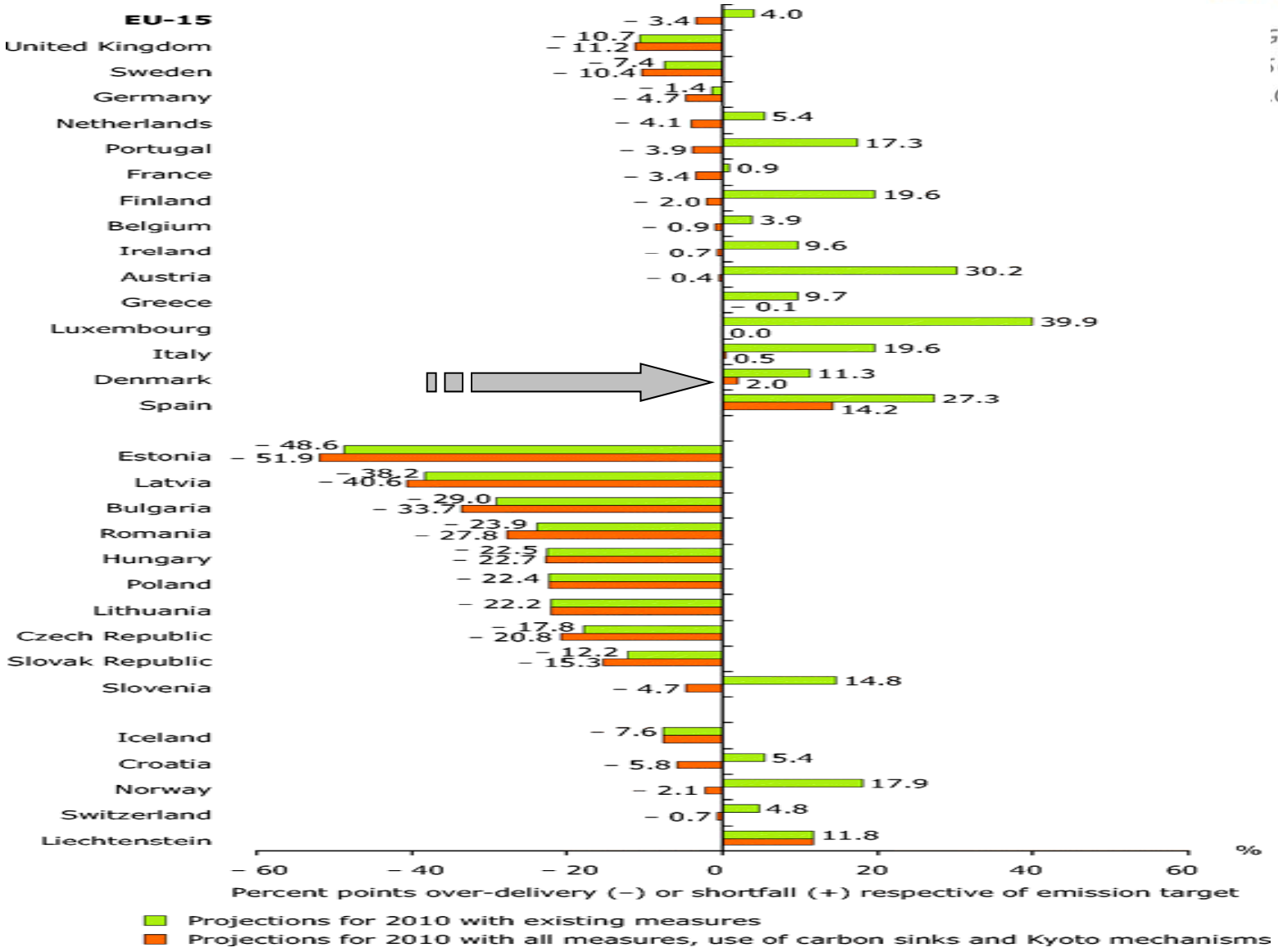
Burden sharing in EU





EU status from 2009 from EEA

Status on achievement EU – EEA 2008



On track, but …….

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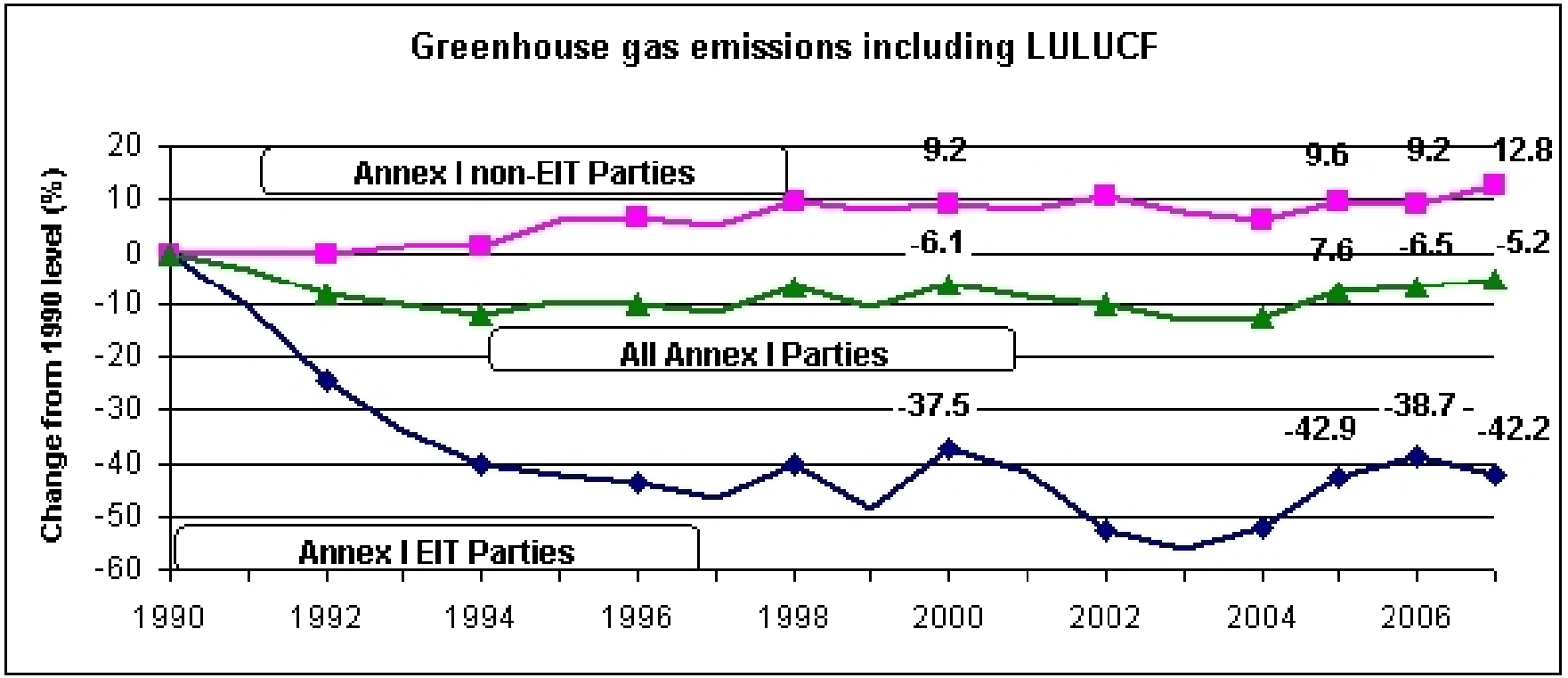
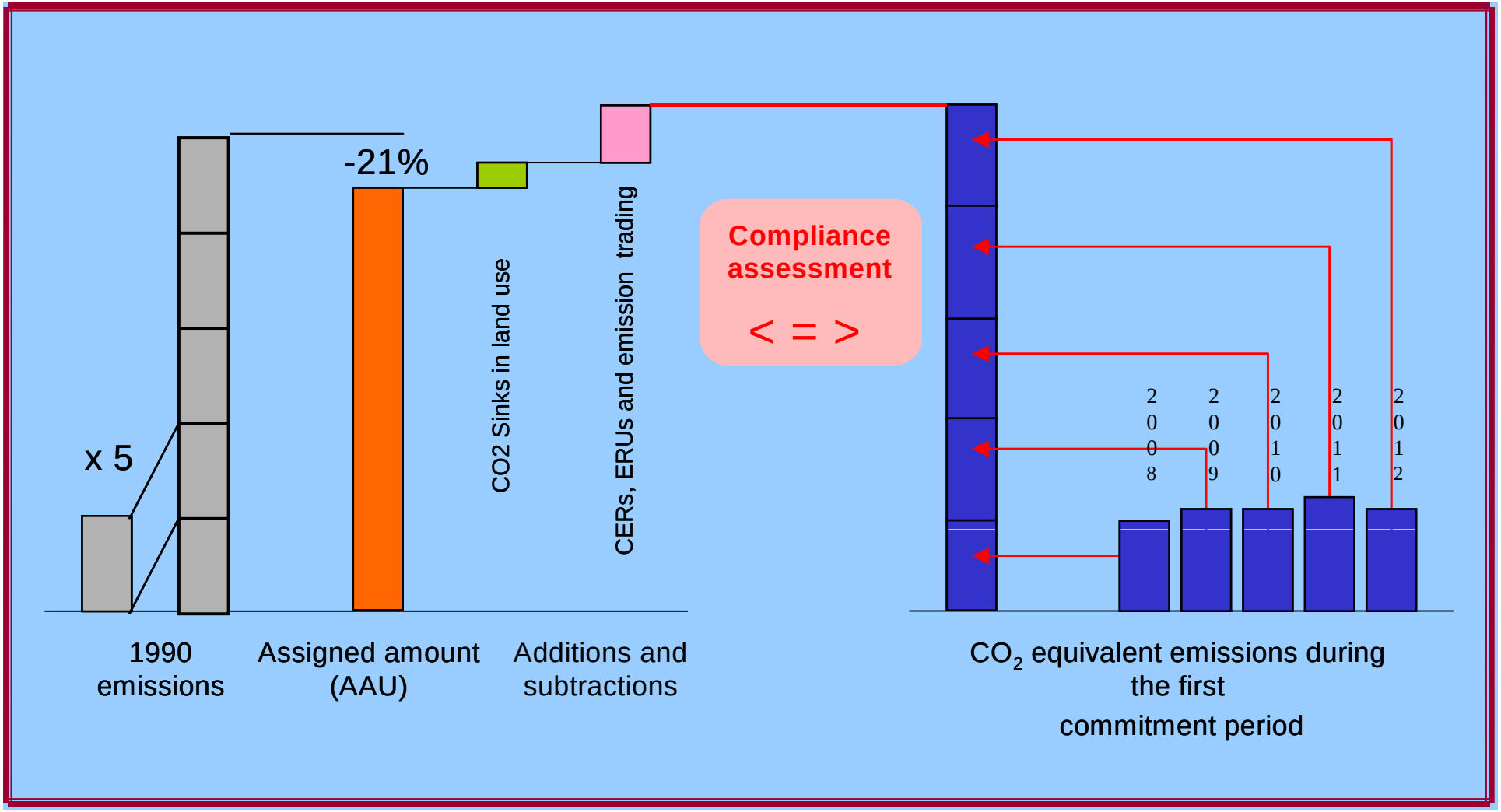


Principles of Kyoto targets



How Denmark plans to reach the target

TABLE 1: KEY FIGURES IN DENMARK'S NATIONAL ALLOCATION PLAN 2008-12

	Expected annual CO_2 emissions 2008-12 (mill. tonnes)	Annual allowance allocation 2008-12 (mill. tonnes)	Annual allowance allocation 2005-07 (mill. tonnes)[4]
Electricity and heat production	20.5	15.8	21.7
Other industries, including offshore	9.2	8.2	9.2
New enterprises		0.5	1
Auctioning		0	1.7
Total CO_2 emissions/allowances in ETS sectors	29.7	24.5	33.5
Non-ETS sectors and gases in total[1]	38.1		
Total greenhouse gas emissions[2]	67.8		
Emission target[3]	54.8		
Deficit	13.0		

Notes:
1: Stated in CO_2 equivalents. Includes emissions of CO_2 by non-ETS sectors and emissions of other greenhouse gases than CO_2 by ETS as well as non-ETS sectors.
2: Stated in CO_2 equivalents.
3: Source .
4: Source (Reference 14).

Current deficit and how to close the gap

TABLE 2: HOW THE DEFICIT WILL BE ELIMINATED

	Mill. tonnes annually
Deficit	13.0
Central government initiatives, including	-6.8
- monitoring CO2 removals by sinks	-2.3
- new national measures within non-ETS sectors	-1.3
- JI/CDM credits, 2003-7	-3.2
To cover possible losses if, contrary to expectations, Denmark does not get compensation for the reference year, and/or to cover uncertainty in projections, inclusion of sinks etc., including	
- contributions from JI/CDM credits from 2008-09 resources	-0.3
- resources in reserve under section 35 of the Finance Act	-0.7
Central government initiatives in total	-7.8
Enterprises' commitment, including	-5.2
- electricity sector	-4.4
- other ETS enterprises (net)1	-0.8
Total	0

Notes:
1: A pool of 0.5 million tonnes/year for new entrants will be established, deducted from other enterprises' net contribution.

EU – ETS
Key Characteristics

- Cap and trade
- CO_2 only (will change from 2013)
- About 50% of the CO2 emission in the EU
- Sectors:
  - Combustion installation with rated thermal input > 20 MW
  - Mineral oil refineries & coke ovens
  - Ferrous metals
  - Mineral industry (cement, glass, ceramics)
  - Pulp and paper
- About 12000 facilities covered

EU – ETS
Key Characteristics II

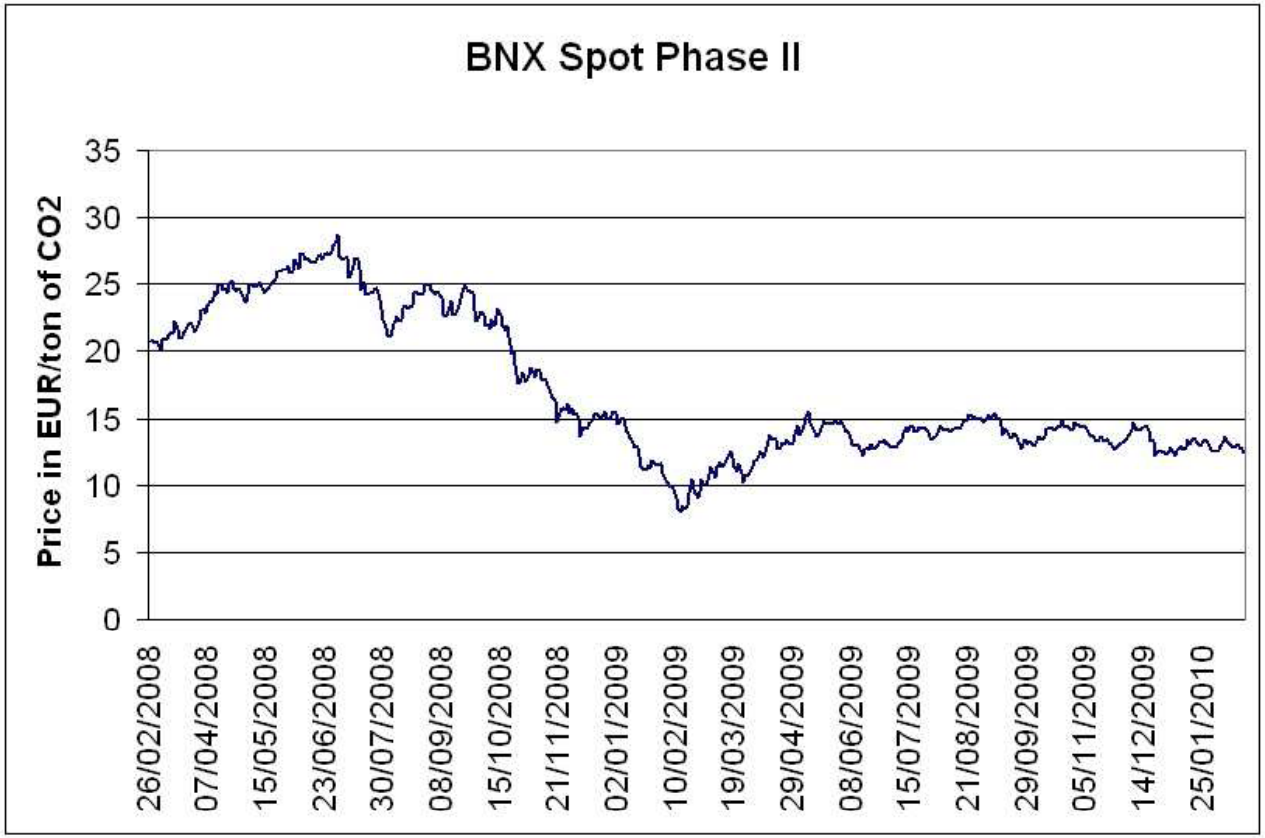
- Three periods (2005-2007, 2008-2012, 2013 - 2020)
- CDM/JI linking directive adopted
- Each EU country sets:
  - National commitment (cap)
  - National Allocation Plan (NAP)
- NAPs have been reviewed by the EU
- In 2005-07 not much reduction in NAPs
- Consequences:
  - more domestic action
  - more severe reductions in 2008-2012

EU – ETS
Key Characteristics III

- Results in 2nd period so far:
  - Moving from test to business with full financial products
  - Impacts of finance crisis strong but temporary
  - Phase III agreement stabilizes market but also increases speculation in futures and possible EU 30% target
- New proposed features for 3rd period
  - Auctioning of credits will increase to over 50% mainly in electricity and aviation
  - Allocations and Auctioning will be regulated at EU level
  - Aviation included from 2012 plus some other new sectors
  - Possibly limits on share of CDM credits

"Recent research shows that the EU ETS is starting to affect investment decisions of major European power generators. These companies see that the EU ETS is here to stay and that by 2020 the European generating fleet wil lbe materially cleaner than it is today."
Director of Carbon Market Research, Bloomberg New Energy Finance

Price and market volume in Phase II



Point Carbon analysts estimate that the volume of transactions on the European carbon market has been growing from 262 million ton in 2005 to 809 million ton in 2006, 1,455 million ton in 2007, 2,713 million ton in 2008, and 5,016 million ton in 2009

Global Carbon Market

- Fragmented market
  - Project-based (baseline and credit system)
    - Emission reductions are created and traded through a given project or activity (JI and CDM)
  - Allowance market (cap and trade system)
    - Emission allowances are defined by regulations at the international, national, regional or firm level - Kyoto-ET, EU-ETS, Domestic: UK, Japan, Canada, Korea. Firms: BP, Shell
    - Linkage between EU ETS and project-based mechanisms
  - Voluntary market
    - Individuals and companies account and trade their greenhouse gas emissions on a voluntary basis (carbon compensation and travel compensation schemes)
    - Several companies expressed interest in buying project-based credits (CERs and ERUs)

Markets are likely to merge over time as agreement widens

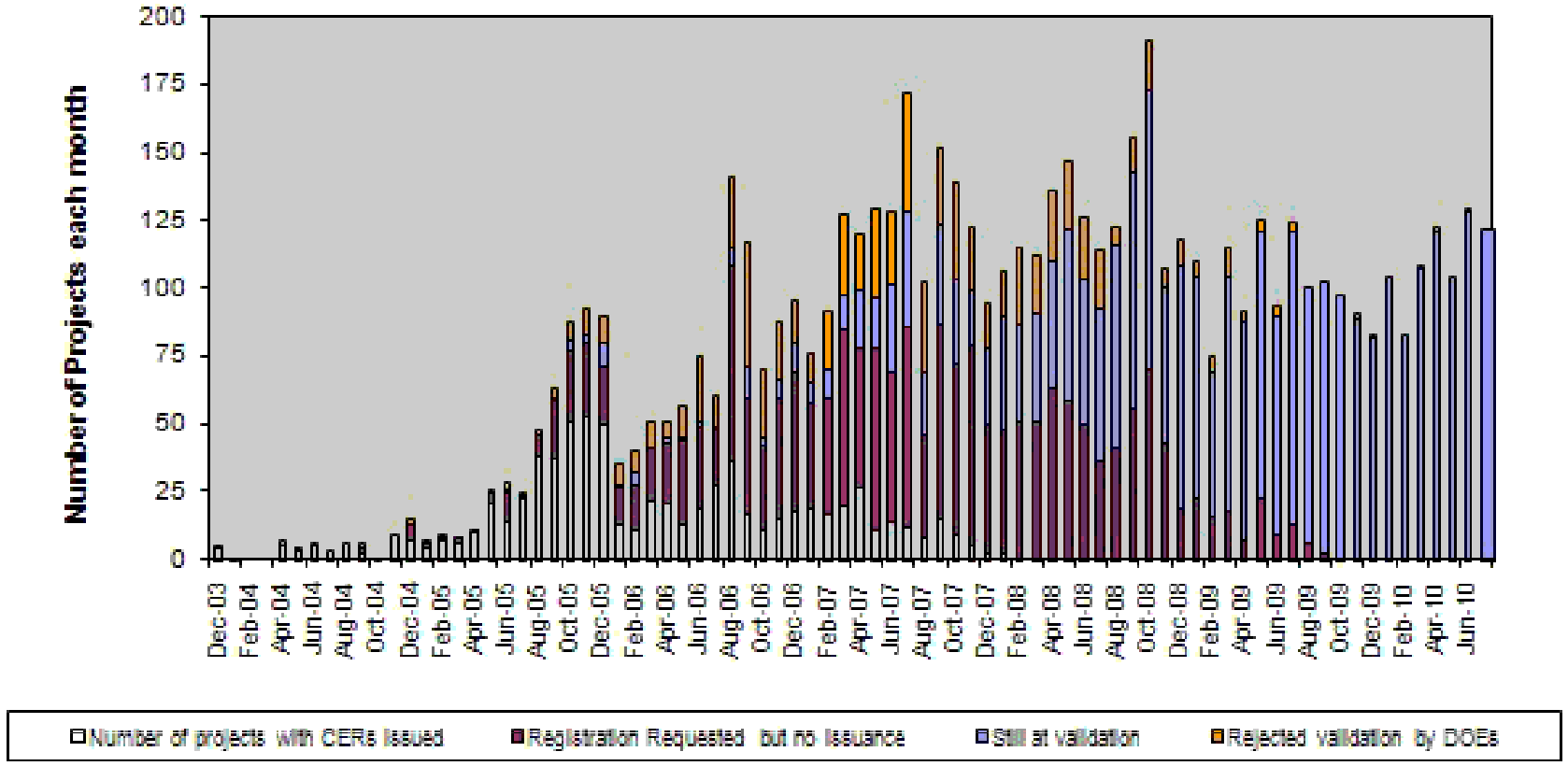
CDM Basics

- CDM is to allow Annex I countries meet part of their emission reduction requirements for first commitment period 2008-2012 at lower costs in non-Annex I countries than could be done domestically.
- Annex I countries are allowed to acquire Certified Emission Reductions (CERs) by implementing GHG mitigating CDM projects in non-Annex I countries.
- Selling CERs is an additional stream of cash inflow to the project, which improves project economics.
- ODA (Official Development Assistance) funds can not be used in CDM investments.
- CDM projects shall support sustainable development in the host country

CDM Challenges

- Quite complex CDM Modalities & Procedures
- Heavy institutional requirements for project cycle (DNA, DOE Validation, DOE Verification, etc.).
- Knowledge gap between CER buyers & sellers.
- Limited access to finance by potential developers:
  - Financial intermediaries lack of knowledge about CDM.
  - Lack of trained national CDM consultants.
  - Investment climate in host countries (e.g. SS Africa).
  - Limited budgets for operations of DNAs.
  - Need for national entities capable of bundling projects.

The monthly number of new CDM projects is currently around 100



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Number of CDM projects and potential credits

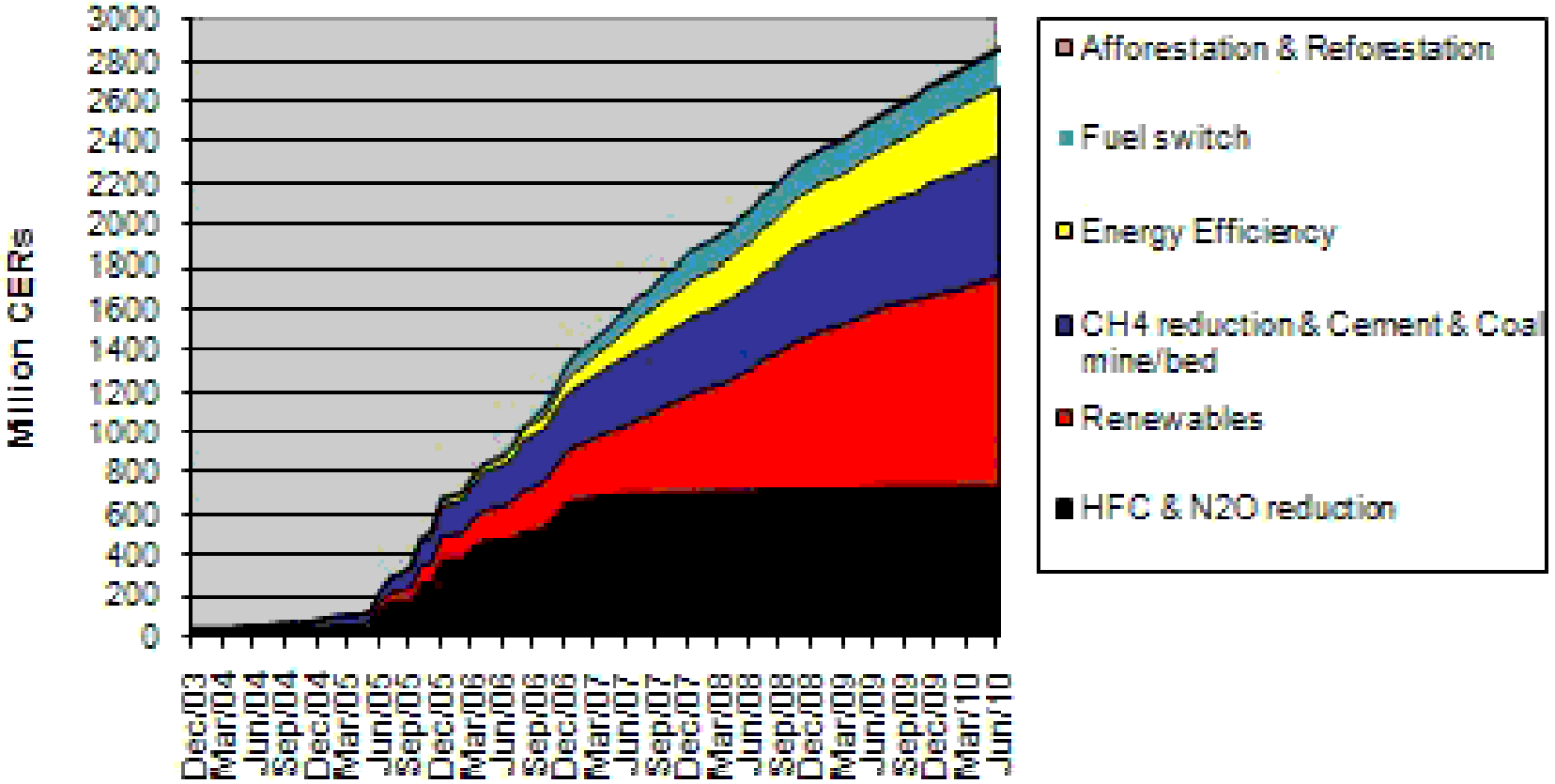
Status of CDM projects	Number
At validation	**2918**
Request for registration	43
Request for review	60
Correction requested	35
Under review	3
Total in the process of registration	**141**
Withdrawn	49
Rejected by EB	172
Validation negative by DOE	158
Validation terminated by DOE	695
Registered, no issuance of CERs	1558
Registered. CER issued	748
Total registered	**2306**
Total number of projects (incl. rejected & withdrawn)	6281

	Expected 2008-12	Available 2008-12	Available 2013-20
CER's	Million CERs (all types)		
2012 CER's expected from existing projects in validation stage	946	0	679
2012 CER's expected from projects requesting registration	100	0	90
2012 CER's expected from registered projects	1841	481	886
Total amount of CERs expected from future projects until 2012	528	0	379
Total amount of CERs from existing projects produced after 2012			3392
Total amount of CERs issued	**424**	**981**	**5426**
Total requesting issuance	76		
Share Of Proceeds (SOP) for the Adaptation Fund	8.5	20	109
Annual amount available		196	678
	Exp 2013-20		
Total amount of CERs from future CDM projects starting after 2012	9564	0	2051

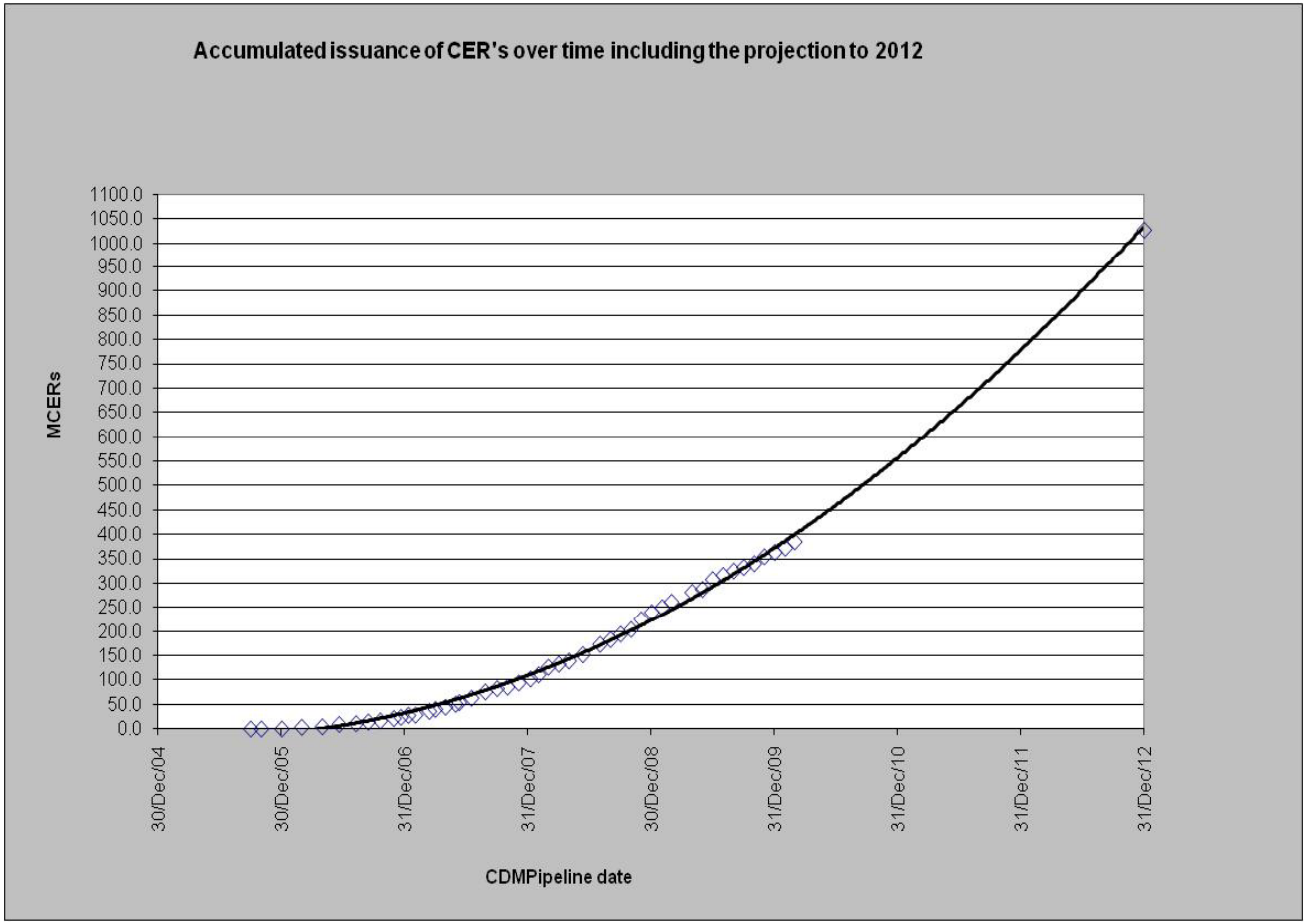
Project types

	CDM							
Type	number		CERs/yr (000)		2012 CERs (000)		CERs Issued (000)	
Hydro	1464	27%	163248	22%	487677	17%	20085	5%
Wind	1006	19%	105451	14%	335214	12%	20780	5%
Biomass energy	697	13%	45434	6%	192976	7%	15847	4%
Methane avoidance	599	11%	28077	4%	120356	4%	6598	2%
EE own generation	451	8%	57740	8%	229599	8%	18325	4%
Landfill gas	315	6%	45409	6%	206540	7%	10126	2%
EE Industry	139	3%	4132	1%	18196	1%	1308	0%
Fossil fuel switch	123	2%	50515	7%	182040	6%	6081	1%
EE Supply side	79	1%	31012	4%	59228	2%	395	0%
N2O	71	1%	50000	7%	253025	9%	95789	23%
Coal bed/mine methane	70	1%	39701	5%	146390	5%	2807	1%
Afforestation & Reforestation	56	1%	4823	1%	16058	1%	0	0%
Solar	55	1%	1169	0%	3188	0%	1	0%
Fugitive	39	1%	17551	2%	68322	2%	4600	1%
EE Households	39	1%	1485	0%	4534	0%	0	0%
Cement	35	1%	6426	1%	32135	1%	1203	0%
Transport	30	1%	3356	0%	9754	0%	201	0%
HFCs	22	0.4%	81715	11%	476516	17%	218637	52%
EE Service	22	0%	285	0%	983	0%	6	0%
PFCs and SF6	17	0%	4961	1%	12971	0%	0	0%
Energy distrib.	17	0%	5450	1%	15894	1%	0	0%
Geothermal	15	0%	3353	0%	14753	1%	684	0%
Tidal	1	0%	315	0%	1104	0%	0	0%
Agriculture	0	0%	0	0%	0	0%	0	0%
CO2 capture	3	0%	29	0%	156	0%	48	0%
Total	5365	100%	751640	100%	2887610	100%	423521	100%
HFCs, PFCs & N2O reduction	110	2.1%	136676	18%	742512	26%	314426	74%
Renewables	3238	60%	318971	42%	1034912	36%	57398	14%
CH4 reduction & Cement & Coal mine/bed	1061	20%	137194	18%	573899	20%	25382	6.0%
Supply-side EE	547	10%	94202	13%	304721	11%	18720	4.4%
Fuel switch	123	2.3%	50515	6.7%	182040	6.3%	6081	1.4%
Demand-side EE	200	3.7%	5901	0.8%	23714	0.8%	1313	0.3%
Afforestation & Reforestation	56	1.0%	4823	0.6%	16058	0.6%	0	0.0%
Transport	30	0.6%	3356	0.4%	9754	0.3%	201	0.0%

The renewable energy category is rising fastest – HFC at its maximum

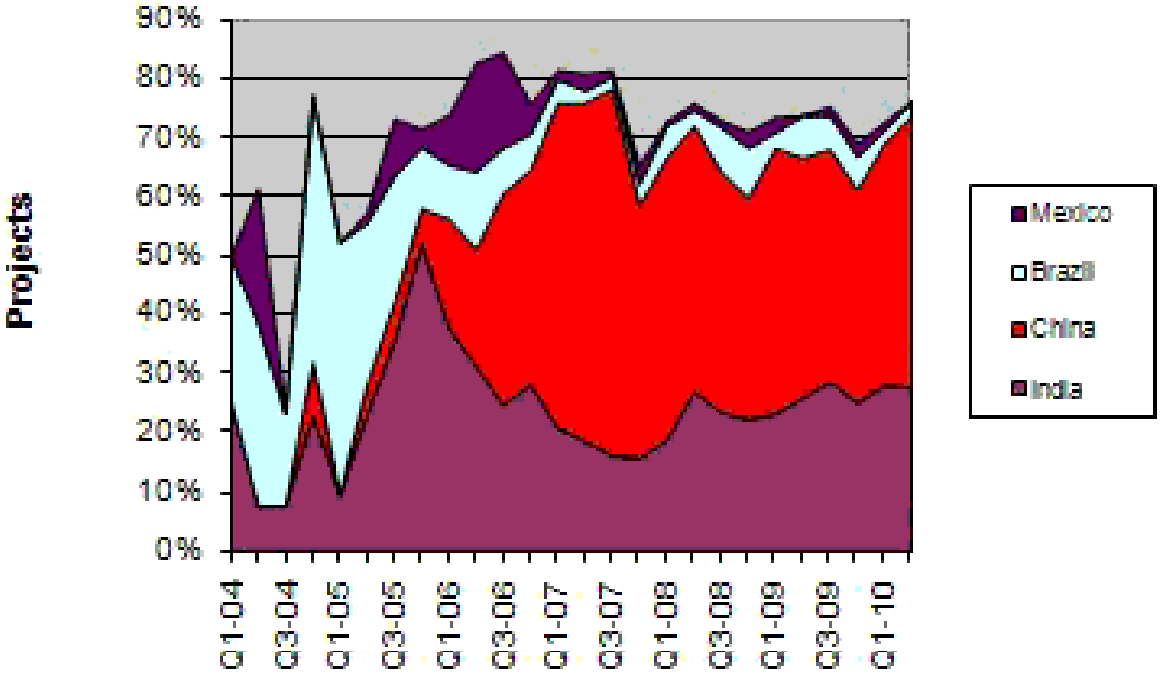


How will the issuance of CERs develop until the end of 2012?



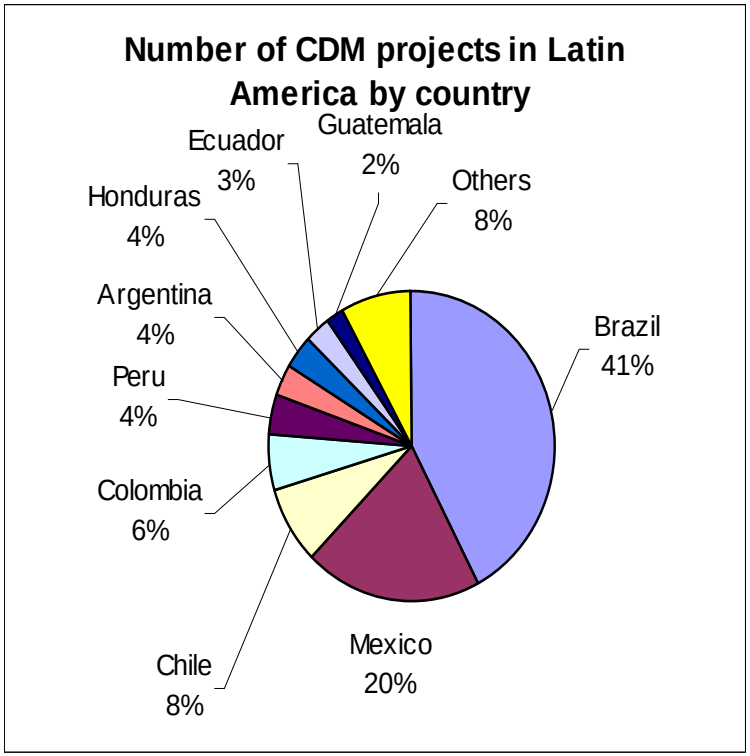
Some regions are left behind

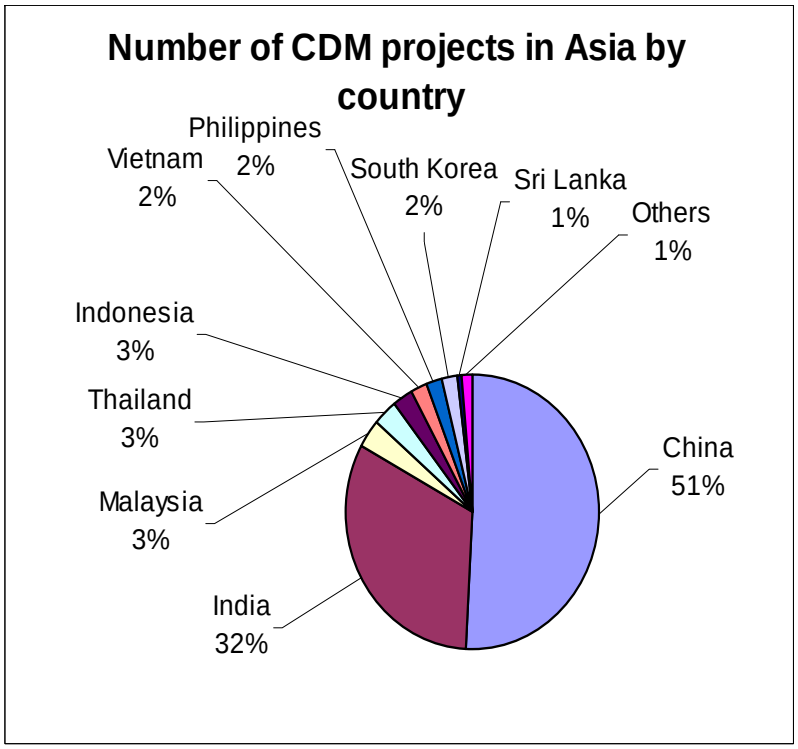
The share of projects outside the big four has increased from 15% to 29% in 2009 but been reduced again in 2010



All CDM Projects in the Pipeline in Brazil + Mexico + India + China as a fraction of all projects

The most active countries in Asia and Latin America





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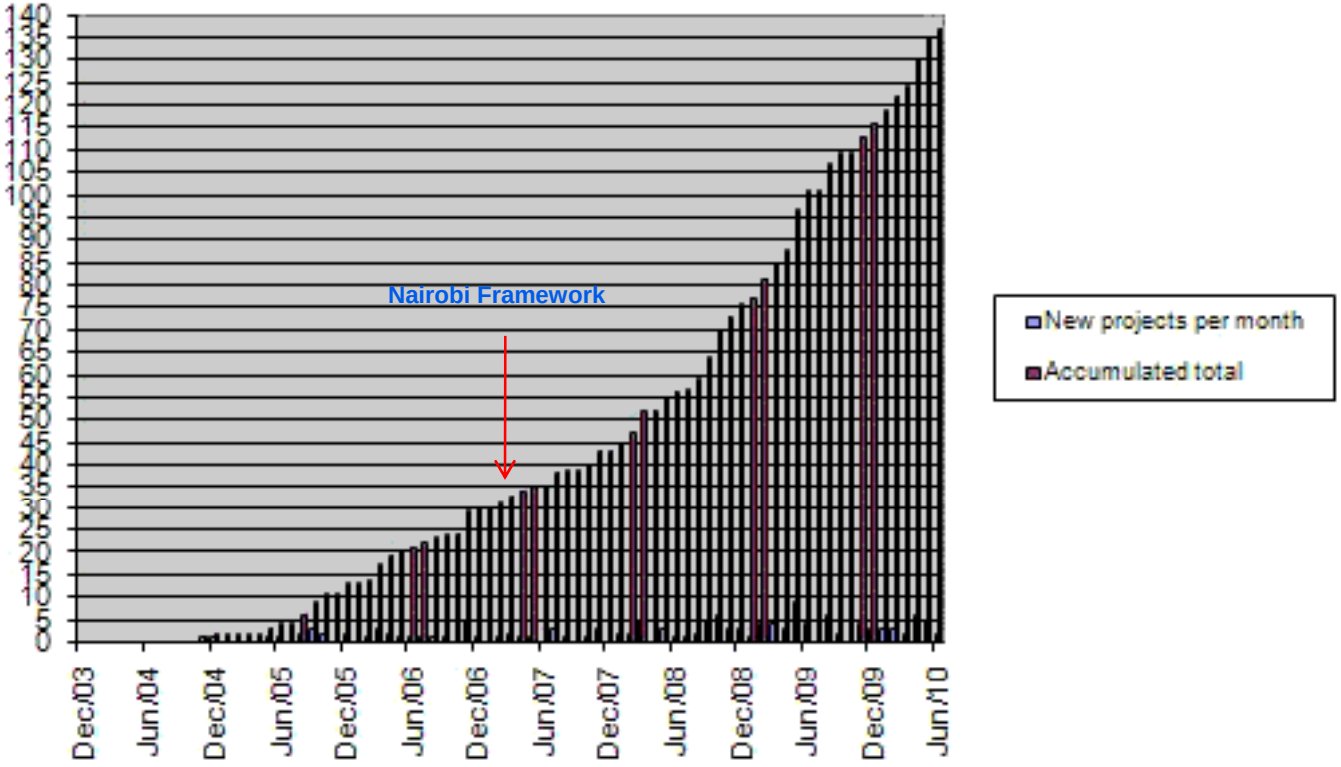
CDM in Africa



Africa	Number
South Africa	32
Kenya	15
Egypt	13
Uganda	12
Morocco	9
Nigeria	8
Tanzania	5
Congo DR	5
Tunisia	3
Ivory Coast	3
Rwanda	3
Cameroon	2
Senegal	2
Mozambique	1
Madagascar	1
Zambia	1
Ethiopia	1
Swaziland	1
Mali	1
Liberia	1
Cape Verde	1
Ghana	1
Mauritius	1
Equatorial Guinea	0
Total	122

How big has the investments been in CDM?

	Number	MW	Investment in project that have requested registration								At	At
Sub-types used in CDM projects	**Total**	Total	**All years**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**validation**	**validation**
			Million US$									
Agriculture	0	0	**0**	0	0	0	0	0	0	0	0	0
Biomass energy	670	8956	**3376**	0	59	1336	1045	544	353	39	5364	211
Cement	33	0	**290**	0	0	119	62	0	108	0	261	0
CO2 capture	3	0	**43**	0	0	0	43	0	0	0	13	17
Coal bed/mine methane	70	1143	**533**	0	0	0	162	145	226	0	689	9
Energy distribution	15	138	**12**	0	0	0	12	0	0	0	3272	0
EE households	32	0	**115**	0	0	0	0	0	34	80	152	12
EE industry	141	125	**708**	0	0	92	331	229	55	0	810	4
EE own generation	455	9921	**3601**	0	0	246	1010	1727	618	0	6027	434
EE service	17	0	**79**	0	0	78	0	0	1	0	55	0
EE supply side	70	33288	**2549**	0	0	7	114	74	2354	0	14844	3056
Forests	52	0	**58**	0	0	4	0	0	50	4	547	9
Fossil fuel switch	111	28631	**8778**	0	0	31	1565	3329	3853	0	4561	813
Fugitive	29	338	**820**	0	0	203	244	37	336	0	526	27
Geothermal	14	621	**489**	0	0	432	13	24	20	0	447	52
HFCs	22	0	**74**	0	6	33	11	3	21	0	6	0
Hydro	1354	45749	**17069**	0	211	980	2164	3737	9080	897	27898	3789
Landfill gas	287	905	**1295**	18	72	316	352	137	363	36	1128	65
Methane avoidance	567	405	**619**	0	50	116	75	55	310	12	791	13
N2O	69	0	**479**	0	20	51	137	142	130	0	39	6
PFCs and SF6	15	0	**371**	0	0	0	0	27	55	288	44	52
Solar	43	387	**1255**	0	0	262	0	6	984	4	1476	90
Tidal	1	254	**0**	0	0	0	0	0	0	0	0	0
Transport	21	0	**374**	0	0	320	54	0	0	0	2479	0
Wind	877	35741	**16698**	0	344	1844	4227	3475	6176	633	25697	5243
Total	4968	166601	**59687**	**18**	**762**	**6470**	**11621**	**13693**	**25128**	**1993**	**97128**	**13902**

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Some examples of small scale projects

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COP15 was kept CO2 neutral, through CDM project in Bangladesh

From the Diamond Brick Factory in Dhaka

Left: Woman stacking green bricks before the bricks are dried in drying chamber using excess heat from the kiln.

Above: Kiln is covered with a roof and coal master adds coal carefully through holes in the kiln ceiling in order to optimize burning of the bricks

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Kuyasa low-cost urban housing energy upgrade project, South Africa

Insulated ceilings; Solar Water Heater installation; and Energy Efficient Lighting. Validated as qualifying for the "Gold Standard".

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Solar PV drinking water disinfection in Rwanda

Will provide bacterially decontaminated water safe for drinking, food preparation and personal hygiene at two sites in rural Rwanda.

Figure 6: Typical Water Boiling in Rwanda

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Partial Substitution of Coal by Jatropha Fruits and Biomass Residues in the Production of Portland Cement in Rwanda.

Substitution of Diesel for truck transport in Zambia

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6 MW Bagasse Based Cogeneration Project in Nyanza, Kenya

Heaps of bagasse behind the factory premises

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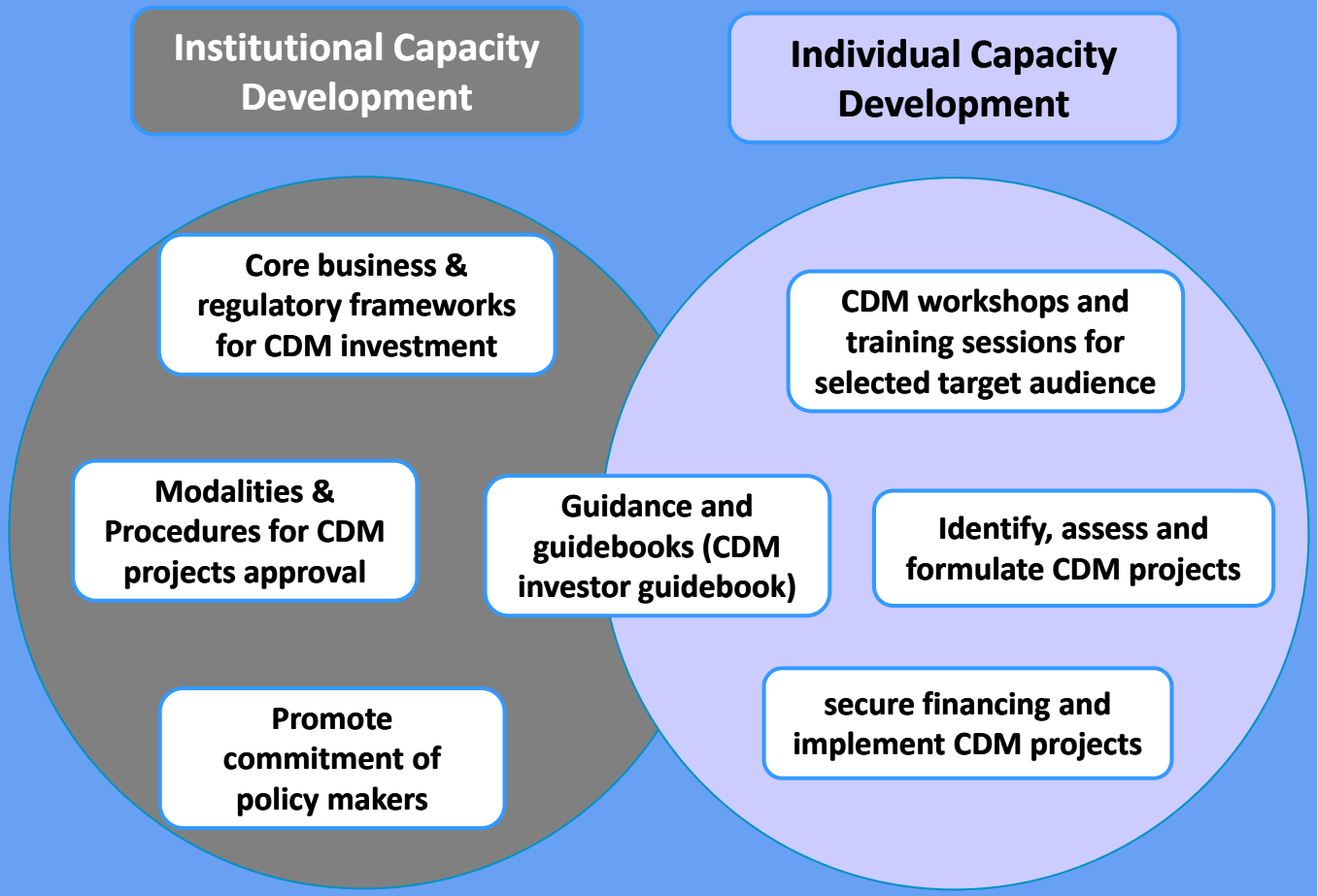
ENERGY, CLIMATE AND SUSTAINABLE DEVELOPMENT

Composting of waste from agricultural markets in Dhaka, Bangladesh

UNEP Contribution to the NF

- A comprehensive capacity development package
- Provision of CDM knowledge and dissemination
- CDM Bazaar & Pipeline
- Provision of technical and financial assistance to country's institutional and individual preparedness for the CDM in more than 40 countries – impact on host country attractiveness as CDM destination
- Support to national CDM portfolio creation and or diversification
- Facilitation of national portfolios promotion and dissemination through regional events, such as the Regional Carbon Forum and in Carbon Expo

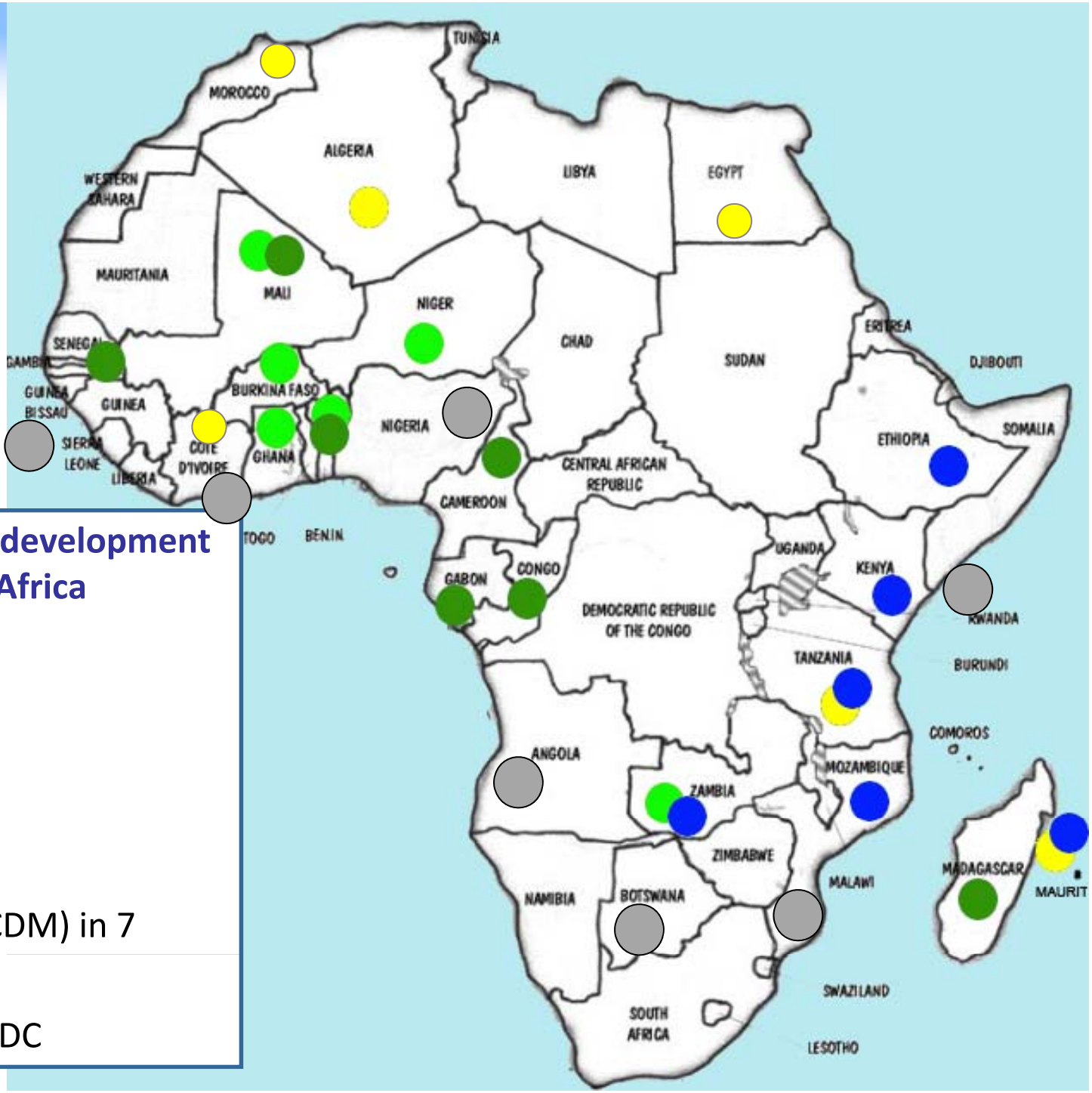
UNEP CDM capacity development program



Creates a national CDM project portfolios and the institutional capability to attract CDM investments

project approval → *project origination*

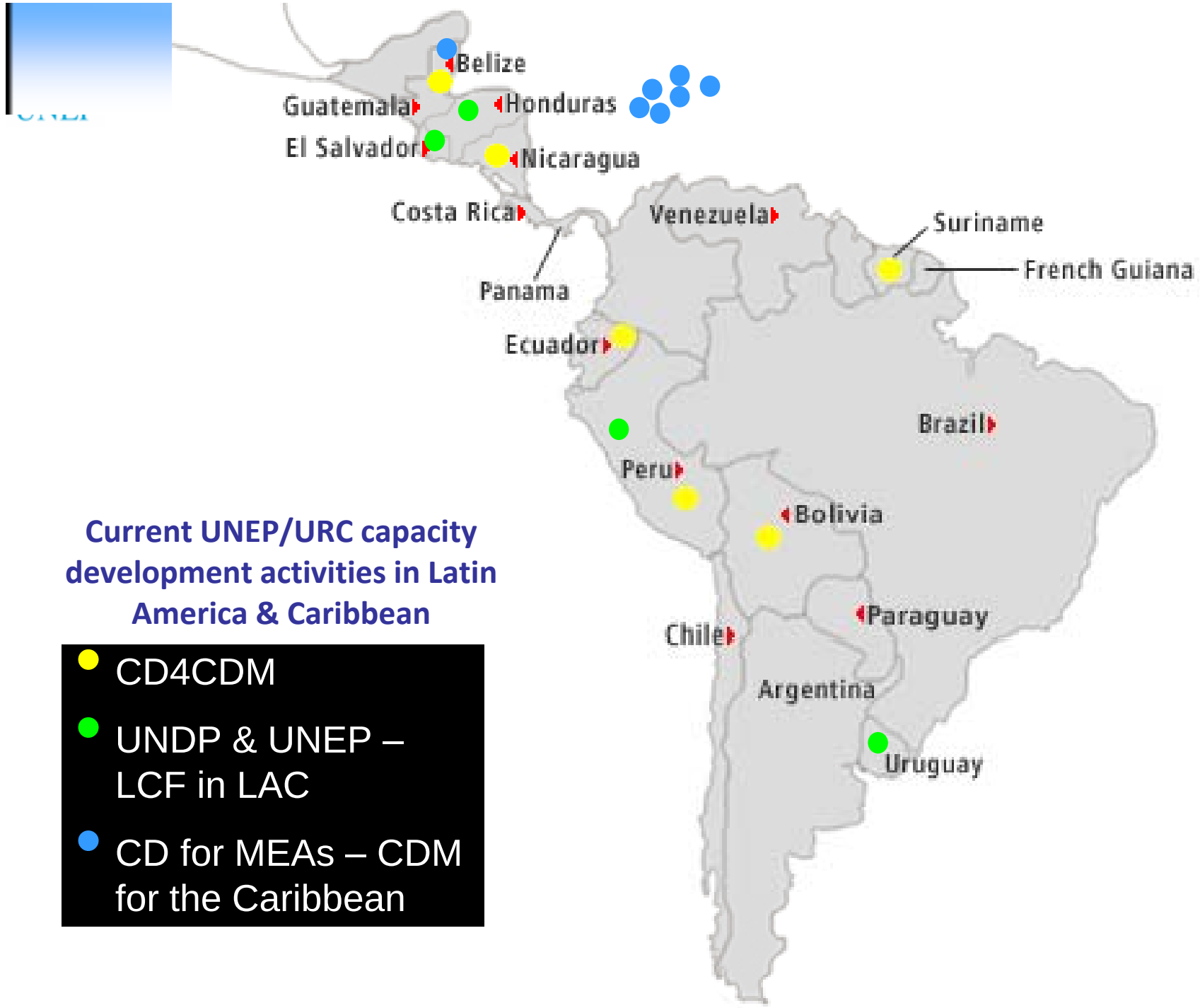
Promotion of national CDM portfolios in Regional Carbon Forums and Expo



UNEP/URC capacity development activities in Africa

- CD4CDM
- Green Facility
- UNDP-UNEP
- CASCADE
- CB for MEAs (CDM) in 7 countries.

28 COUNTRIES; 11 LDC



Current UNEP/URC capacity development activities in Latin America & Caribbean

- CD4CDM
- UNDP & UNEP – LCF in LAC
- CD for MEAs – CDM for the Caribbean

ACP – CD4CDM

Project Overview

- Funded by the EC – EUR 4,3 millions
- Simultaneous execution in 12 ACP countries + regional activities in the Caribbean and the Pacific
- Duration: 4 years
- Executing Agency: UNEP Risø Centre, in close coordination with CARICOM & 5C the AUC and SPREP and local partners.

Objectives

- enable targeted ACP countries to participate in the global carbon market
- provide skills to identify, design, approve, finance, implement and monitor CDM projects,
- emphasise the development of a regional CDM projects portfolio that could be marketed in international carbon events
- support the provision for Designated National Authority (DNA) website.

ACP – CD4CDM

Project participating countries

- **Africa**: Angola, Botswana, Côte d'Ivoire, Malawi, Nigeria, Rwanda and São Tomé and Principe
- **Caribbean**: Belize, Cuba and Trinidad and Tobago. Regional activities will also be conducted.
- **Pacific**: Fiji and Solomon Islands. Regional activities will also be conducted

ACP – CD4CDM – National level

- National CDM Project Portfolios
  - Potential sectors for CDM projects will be prioritized
  - 48 Project Idea Notes (PINs) will be developed (4 per country)
  - 24 Project Designs Documents will be formulated (2 per country)
  - 4 POA PINs will be developed (2 per region)
  - 2-4 POA – DDs will be formulated for each region
- Promotion of CDM Portfolios
  - 3 Regional Carbon Forums will be organized
  - Participating country delegations will be supported to participate in Carbon Expo 2011
  - 3 Regional Carbon Forums for the Financial sector
  - National CDM websites will be developed

ACP – CD4CDM – Regional level

- Regional Work plans have been finished
  - Identification/selection of two to three high-potential sectors for Program of Activities (POAs), that might be implemented at regional level, i.e., in several Island States
  - Regional POA Training Workshop (A regional workshop to present and discuss potential ideas for one or more Program of Activities under the CDM).
  - 2 Regional Workshop for DNAs
  - 4 POA PINs and 2POA DD for prioritized sectors in each region
  - A regional workshop to present developments of PINs and POAs
  - A regional Carbon Forum
  - A regional Carbon Finance Bankers' Forum
  - Participate in Carbon Expo to present and promote portfolio of PINs and PDDs

ACAD
African Carbon Asset Development

ACAD Facility:
a PPP to Catalyze the African Carbon Market

UNEP
UNEP RISØ CENTRE
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
Standard Bank

Introducing

- Innovative **PPP** for green financing supported by German Government with two aims:
  - Facilitate realization/closure of replicable carbon projects
  - Mainstream carbon capacity within African financial sector
- Secretariat embedded in **Standard Bank** following UNEP tender
- ACAD as **catalytic platform**
  - Risk sharing model, public-private finance, seed capital + TA
- Addresses key barriers to more robust African market by:
  - Enhancing transactional capacity within African banks
  - Reducing high early-stage costs and risks
  - Providing a jump-start financing solution

Key Activities

- **Provide transaction cost sharing services** with accompanying technical support to leverage closure of 10-12 replicable transactions
  - Roughly €50,000 per project
  - Local financiers, developers, or project proponents can apply
  - Can disburse to service provider of choice and cover CDM documentation development, carbon auditing, registration fees, enviro-legal studies, etc.

- **Enhance hands-on skills** amongst African banks in project origination, financial appraisal, and due diligence
  - Four advanced training workshops for developers and African FIs: Cape Town (Oct. 2009), Nairobi (Mar. & June 2010), Lagos (August 2010)
  - Additional in-house clinics and training for Standard Bank & clients

- **Investor outreach/mobilization**
  - 2nd African Bankers' Carbon Finance & Investment Forum, Jo'burg, **Nov. 4 - 5, 2010**

Approved Projects to Date

1. Lake Turkana Wind Power Project, KENYA
2. Lagos State Waste Management Authority Landfill Gas Projects in Lagos, NIGERIA
3. Athi River Mining Kaloleni Cement Plant Fuel Switch/EE project, KENYA
4. Matola Cement Coal to Gas Fuel Switch, MOZAMBIQUE
5. Clay Brick Sector EE Program – SOUTH AFRICA
6. International Ferrometals Waste Gas Co-generation – SOUTH AFRICA
7. APA Integrated Waste Management Program, NIGERIA

Analytical Activities & Publications

Support the informational and educational objectives of our capacity development activities

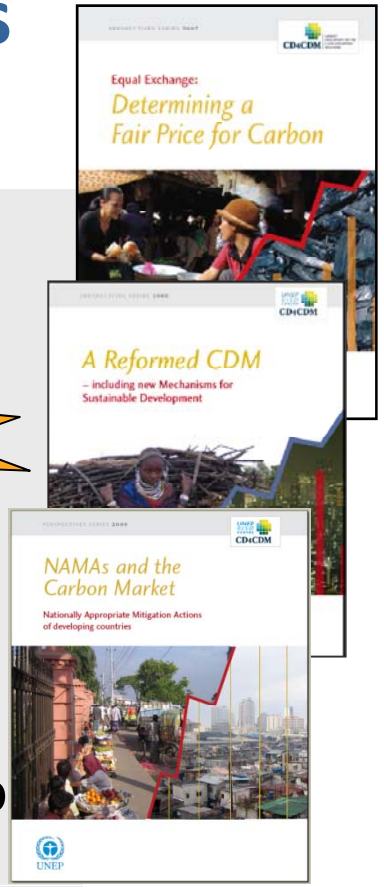
- Guidebooks on specific issues of the CDM
  - Introduction to the CDM: 2002
  - CDM Information and Guidebook: Dec. 2003
  - Institutional strategy to promote the CDM in Peru: Feb. 2004
  - CDM legal issues Guidebook: May 2004
  - Institutional issues in CDM implementation: May 2004
  - CDM and Sustainable Development: Feb. 2004
  - Guidebook on developing baselines for CDM projects: June 2004
  - PDD Guidebook: Navigating the Pitfalls - Second edition: April 2008)
  - Guidebook to Finance CDM projects: May 2007
  - Implementing CDM Projects: Guidebook to Host Country Legal Issues: August 2009
  - A Primer on CDM Programme of Activities: November 2009

provide targeted audiences with 'reference' manuals containing clear operational instructions on concrete topics for which public information is already available.

Analytical Activities & Publications

- Carbon Market Perspective Series
  - 2010 - Can Carbon Markets Promote REDD+ Activities in Developing Countries
  - 2009 - NAMAS and the Carbon Market
  - 2008 - A Reformed CDM - Including New Mechanisms For Sustainable Development
  - 2007 - Equal Exchange: Determining a Fair Price fo Carbon

Upcoming

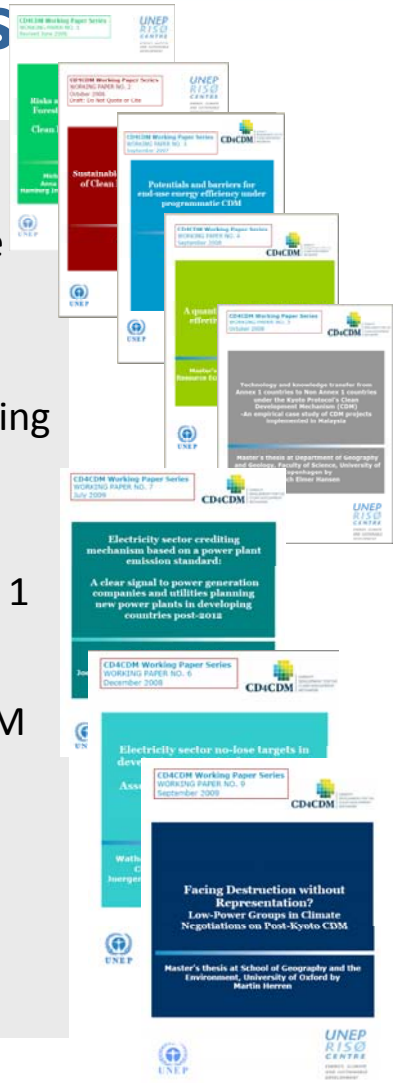


aims at comprising an annual special feature on a topic of pivotal importance to all developing countries in the global carbon market

Analytical activities & publications

- CD4CDM Working Paper Series

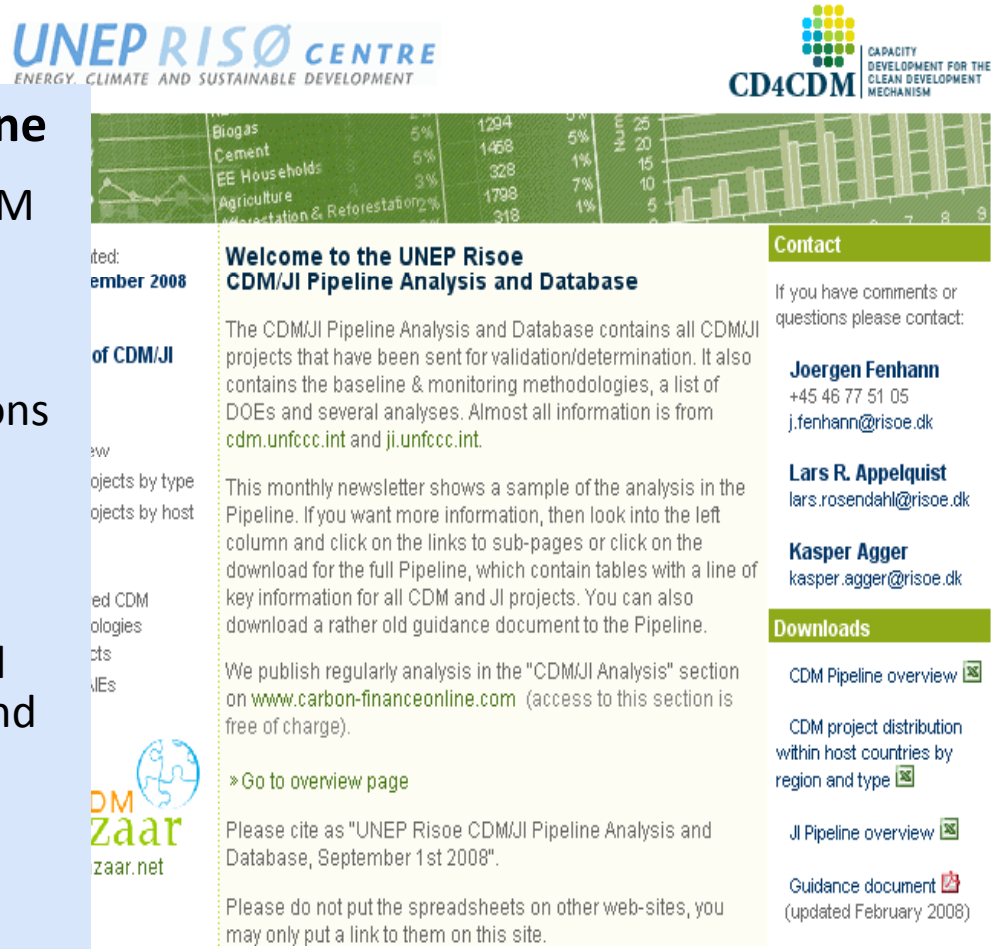
1. Facing Destruction without Representation? Low-Power Groups in Climate Negotiations on Post-Kyoto CDM
2. PoA CDM Manual - Mini Biogas Plants for Households
3. Electricity sector crediting mechanism based on a power plant emission standard: A clear signal to power generation companies and utilities planning new power plants in developing countries post-2012
4. Electricity sector no-lose targets in developing countries for post-2012: Assessment of emissions reduction and reduction credits
5. Technology and knowledge transfer from Annex 1 countries to Non Annex 1 countries under the CDM - An empirical case study of CDM projects implemented in Malaysia
6. A quantitative analysis of the cost-effectiveness of project types in the CDM Pipeline
7. Potentials and barriers for end-use energy efficiency under programmatic CDM
8. Sustainable Development Benefits of Clean Development Projects
9. Risks and Chances of Combined Forestry and Biomass Projects under the Clean Development Mechanism



analytical in nature and are designed to address critical policy issues and methodological barriers constraining the CDM through cutting-edge independent research.

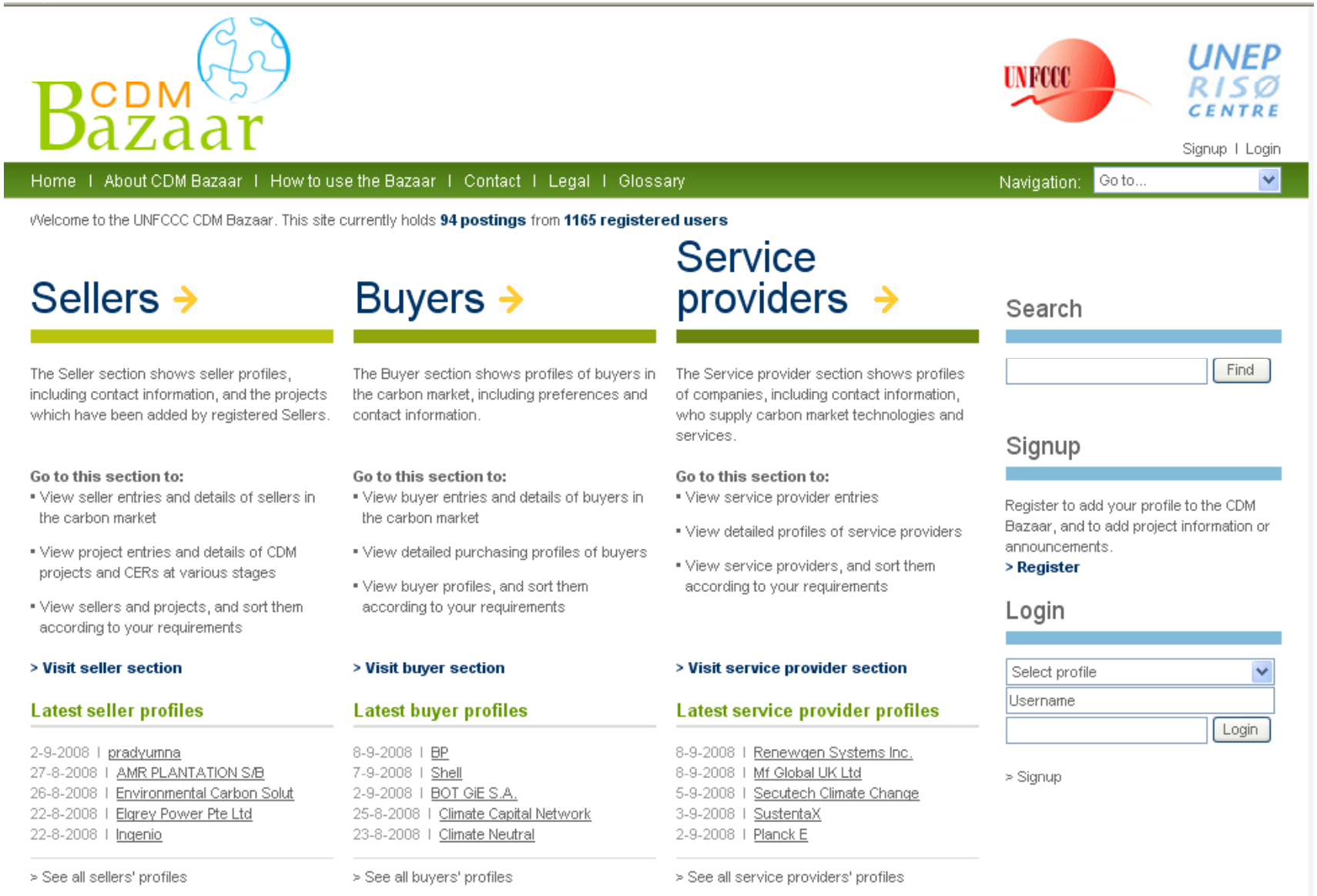
Analytical activities & publications

- **CDM data & analysis - CDM&JIPipeline**
  - A web based data base compiling CDM projects
  - Analysis and market surveillance
  - Projections of GHG emission reductions
  - Calculation of different parameters
  - It also contains the baseline & monitoring methodologies, a list of DOEs and several analyses. Almost all information is from cdm.unfccc.int and ji.unfccc.int.



Data base and analysis providing monthly

Virtual platform for information exchange



Regional activities

Investment mobilization and engaging the finance sector

- African Bankers' Carbon Finance Investment Forum. May 2007 & October 2010 Johannesburg
- Dakar, Senegal: Carbon finance perspectives for the banking sector. Feb 12-14, 2008
- Training finance sector staff – Regional Financial Sector CDM Forum, Lima, Nov 2008
- Finance guidebook

Regional Carbon Forums

- **Africa Carbon Forum,** Senegal**,** Sep. 2008**;** Kenya, March 2010
- **Latin America Carbon Forums,** Quito 2006, Lima 2007, Santiago 2008, Panama 2009, DR 2010
  - ✓ Knowledge and information sharing platforms
  - ✓ Bring together CDM stakeholders to benefit from:
  - ✓ Updates on Carbon markets; technical knowledge sharing on conferences; trade fair and capacity-development sessions,
  - ✓ Organizers: IETA, UNEP/Risø, WB, OLADE, UNDP, and UNFCCC

UNEP POA Facility

- **Facilitating 'Programmes of Activities' for the Clean Development Mechanism (CDM) in Africa (FPAC)**
- Provide sub-Saharan Africa with access to international carbon finance
- The Programme will demonstrate pilot renewable energy applications under "Programmes of Activities" (PoAs)
- The pilot schemes will be disseminated across Africa for independent replication.
- The pilots will directly benefit host communities
- The outputs are expected to include: four country pilot schemes, and one regional pilot, to test and demonstrate the PoA approach; communities in pilot locations have access to cost effective and efficient energy;
- PoA pilot schemes demonstrated for independent replication across Africa.

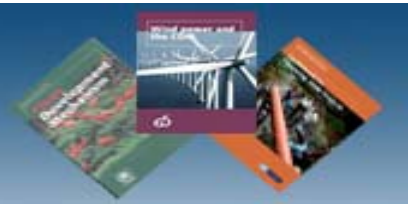
Web based tools and platforms

- Web based CDM Methodology Selection Tool

NEW

- A handy and simple tool
- Categorizes methodologies by technology
- It facilitates choosing a methodology that is applicable to the type of CDM project you are planning to develop
- Builds on the list of approved methodologies
- It is updated regularly
- It is a work in progress – comments and suggestions for improvement are welcome

CDM
Technologies & Methodologies



Web based selection tool and info platform

- CDM Methodology Fact Sheets

NEW

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Type	Number of CDM projects (rejected projects excluded)		Estimated CERs (000)/ year		Number of CDM projects with CERs issued		Issuance success	CERs (000) issued	
Wind	877	17.4%	78016	11.5%	134	25.2%	83%	16842	4.5%
Total	4926	100%	680327	100%	650	100%	97%	372352	100%

Region and "top3" countries	Number of wind CDM projects in the pipeline		Region and "top3" countries	Number of wind CDM projects in the pipeline		Region and "top3" countries	Number of wind CDM projects in the pipeline		Region and "top3" countries	Number of wind CDM projects in the pipeline	
Mexico	16	36.4%	China	430	53.8%	Egypt	4	50.0%	Cyprus	6	85.7%
Brazil	10	22.7%	India	351	43.9%	Morocco	3	37.5%	Israel	1	14.3%
Chile	6	13.6%	South Korea	13	1.6%	Cape Verde	1	12.5%	-	-	-
Other countries	12	27.3	Other countries	5	0.1%	Other countries	0	0%	Other countries	0	-
Latin America	44	100%	Asia and the Pacific	799	100%	Africa	8	100%	Europe, Central Asia and The Middle East	7	100%

Source: UNEP Risoe CDM/JI Pipeline Analysis and Database, February 1st 2010

HYDRO

Hydro CDM projects are divided into small scale (less than 15 MW) and large scale projects. During 2008 small hydro installations grew by 28% to raise the total world small hydro capacity to 85 GW.

World wide hydroelectric power (small scale and large scale) supplies 20% of world electricity. Given the right location, hydro power is a low maintenance source of renewable energy.

Description of technology

The energy in falling water can be converted into electrical energy or into mechanical energy to pump water or grind grain. The main components of hydro systems are the turbine and the generator. Other components include the physical structures to direct and control the flow of water, mechanical and/or electronic controllers, and structures to house the associated equipment. Different types of turbines are available and the optimum choice depends strongly on the head and the water flow rate. Generally, a high head site will require smaller, less expensive turbines and equipment. For most hydro projects, water is supplied to the turbine from some type of storage reservoir, usually created by a dam or weir. The reservoir allows water to be stored and electricity to be generated at more economically desirable times – during periods of peak electrical demand, for example – when the electricity can be sold for a higher price. In these systems the amount of electrical power that can be generated is determined by the amount of water that is stored in the reservoir and the rate at which it is released.

The most environmentally-sound hydro systems do not impact the amount or pattern of water flow that normally exists in the river or stream. Such "run-of-river" systems may use a special turbine placed directly in the river to capture the energy in the water flow. A conventional plant may also operate as a runoff river system if the natural variability of the river flow is maintained. However, this type of system may generate less power during times of low water flow.

Small scale hydro systems are modular and can generally be sized to meet individual or community needs. However, the financial viability of a project is subject to the available water resource and the distance the generated electricity must be transmitted. Hydro systems do not create any pollution when they are operating, and generally offer highly reliable power. They also have very low running or maintenance costs, and they can be operated and maintained by trained local staff. Hydro systems generally have a long project life. Equipment such as turbines can last 20–30 years, while concrete civil works can last 100 years. This is often not reflected in the economic analysis of hydropower projects, where costs are usually calculated over a shorter period of time. This is important for hydro projects, as their initial capital costs tend to be comparatively high because of the need for civil engineering works.

Hydro developers generally need to invest in detailed analyses before a project can proceed. Regulatory authorities may require structures or systems that prevent adverse effects on flora and fauna, particularly fish. Conversely, some hydro systems may enhance local environments through, for example, the creation of wetlands.

Example of application

Title: "Santa Cruz I Hydro Power Plant" (ref. no. 2405)

The CDM project is a run-of-river hydropower plant, located north east of Peru's capital city of Lima at 1,985 meters above sea level in the basin of the Blanco River (Santa Cruz) in the district of Colcas. The plant will have an installed capacity of 5.9 megawatts and a projected yearly average generation of 35,827 megawatt hours. The objective of the Santa Cruz I Hydroelectric Power Plant is renewable electricity generation to be supplied to the Peruvian National Inter-connected Electric Grid.

Project investment: USD 7,500,000

Project CO2 reduction over a crediting period of 7 years: 118,490 tCO2e

Expected CER revenue (CER/USD 10): USD 1,184,900

Common methodologies

The methodologies presented here are the ones mainly used by the project developers in the different hydro projects in the CDM pipeline.

- ACM2 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
- AM52 "Increased electricity generation from existing hydropower stations through Decision Support System optimization"
- AMS-I.D."Grid connected renewable electricity generation"
- AMS-I.A."Electricity generation by the user" http://cdm.unfccc.int/methodologies/index.html

CDM status

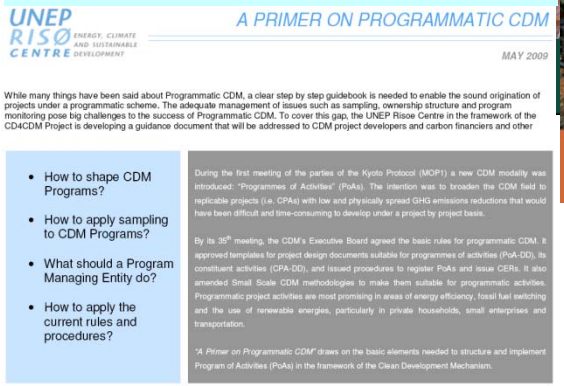
CDM projects based on hydro hence represent 27.4% of all CDM projects in the pipeline and is the most common project type in the pipeline. The geographical distribution of hydro projects is concentrated around Asia and in particular China.

A snapshot review of technologies used to date in CDM activities, including:

- An example of application including:
- Investment
- Estimated CERs revenues
- Performance under CDM
- Methodology applicable to the technology

Thank you!!

Upcoming – May 2009



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